

A NEW BROMELIAD FROG OF THE GENUS  
*ELEUTHERODACTYLUS* FROM COSTA RICA

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On the evening of February 4, 1963, accompanied by Professor John L. Mohr and Richard S. Casebeer of the Department of Biological Sciences of the University of Southern California, I visited the famous bird collecting locality (Carriker, 1910) at La Hondura, Provincia de San José, Costa Rica. The area is little changed since Carriker's day and as it was the middle of the dry season relatively few amphibians were taken. Just before returning to San José for the night, Dr. Mohr suggested that we examine some bromeliads that he had located. The first bromeliad contained only the common *Eleutherodactylus diastema*, but another plant produced two small frogs, one an *E. diastema*. The other example had a brilliant green body and bright red-orange head and eyes, and appeared to represent a species not previously known from Central America. Subsequent study has confirmed this original impression and the single specimen must be regarded as being from an undescribed species population. The new form will be called,

***Eleutherodactylus moro*, new species**

Figure 1

*Holotype*: Costa Rican series number 765, University of Southern California.

*Type Locality*: Costa Rica: Provincia de San José: Canton de Coronado: La Hondura, 1245 meters (4085 feet).

*Diagnosis*: A species differing from all known Central American members of the genus in the striking life colors of red and green. Apparently related to the *Eleutherodactylus diastema* group (*diastema* Cope, 1875; *hylaeformis* Cope, 1875; *vocator* Taylor, 1955) with which it shares the character of weakly T-shaped terminal phalanges. *E. moro* differs from *diastema* and its allies and the other



Figure 1. Dorsal view of holotype of *Eleutherodactylus moro*, new species. Photograph by William A. Bussing.

small *Eleutherodactylus* with which it might be confused when preserved, *E. caryophallaceous* and *E. ridens*, in lacking supraorbital warts and a wart on the heel. From all of these species except *caryophallaceous*, it further differs in having a completely smooth dorsum without warts or pustules.

*General Characteristics:* Head viewed from above, as broad as long. Snout subovoid. Upper eyelid smooth, much longer than broad, length about one-third head length. Eyes bulge up prominently above surface of interorbital region. Canthus rostralis rounded, loreal region slightly oblique. Skin of head smooth.

In profile canthus slopes gently from eye to nostril, outline of tip of snout slopes posteriorly at a slight acute angle to mouth. Nostrils directed laterally and slightly upward. Orbit longer than high, greatest diameter about half of tarsus length. Pupil horizontally

elliptical; eye covered by two membranous eyelids. Distance from eye to tip of snout greater than orbit. Tympanum barely indicated. Throat weakly granular.

Tongue cordiform; vomerine teeth in two small patches posterior and internal to choanae; choanae ovoid, main axis at right angle to longitudinal axis of head; a pair of large vocal slits at level of posterior base of tongue, ostia pharyngea small.

Dorsum and upper surfaces of limbs smooth. Upper arm completely free of any axillary fold, approximately one-half standard length. Fingers in order of increasing length 1-2-4-3; no webbing. All fingers with distinct rounded disks, slightly broader than fingers of fingers 1-2, about 1.5 times as broad as fingers 3-4. Well-developed rounded palmar tubercle and elongate thenar tubercle; palm smooth, subarticular tubercles large, rounded. Legs much longer than standard length. Toes in order of increasing length 1-2-3-5-4; fourth toe slightly shorter than tarsus; no webbing. All toes with distinct rounded disks, about equal to those on fingers, slightly broader than toe 1, about 1.5 times as broad as toes 2-3-4-5. No tarsal fold. Inner and outer metatarsal tubercles smaller than palmar and thenar tubercles; outer rounded and raised, inner flat and elongate. Sole with a number of smooth tubercles; subarticular tubercles large, rounded equal to those on hand. Belly and posterior surface of thigh distinctly granular.

*Measurements:* Standard length 19.5 mm. Subsequent measurements indicate values in millimeters, followed by percentage of standard length in parentheses. Head length 7.0 (36); head width 7.0 (36); orbit 2.5 (13); snout, eye to tip, 3 (15.2); upper eyelid length 3 (15.2); arm 11 (56.5); third finger length 4 (20.5); hind leg 29 (174); tibia 7 (36); tarsus 5.5 (28.4); fourth toe length 5 (25.5).

*Coloration:* In life, dorsal surfaces of body and limbs dull enamel green, limbs slightly lighter than back. A dark mark across wrist. Upper eyelids and area from halfway between eyes to snout bright orange-red. A few red flecks continuing posteriorly from eyelid to posterior margin of head. Red coloration extending down about halfway to lip in loreal region, below nostrils and two-thirds way down anterior tip of snout toward lip. Iris of eyes orange-red. Undersides pale greenish yellow. Belly transparent, peritoneum white, clearly visible through skin; pericardial sac white; a pair of large white glands visible through skin of throat directly below eyes. No other internal organs visible through skin.

In preservative (Fig. 1), dorsum and upper surfaces of limbs pale

white, transparent. Some brownish pigment on upper surfaces of legs and arms; a dark brown mark across wrists. Surface of head pale brownish-white, with a distinct brown interorbital blotch between posterior half of eyes. A narrow brown line runs from posterior corner of eye backward at oblique angle onto back. Tip of snout and loreal region with considerable brown punctations, a weak dark postorbital line present. Undersurfaces, except for some pigment along lower lip, immaculate yellowish-white.

*Distribution:* Known only from the type locality at La Hondura in the Subtropical Rainforest association of Holdridge (1964).

*Remarks:* The inadvisability of describing new forms of *Eleutherodactylus* based upon single specimens has been repeatedly demonstrated. The most recent example is Lynch (1964) where two nominal species, obviously junior synonyms, are proposed from single poorly preserved specimens from Panamá: *Eleutherodactylus tiptoni* [= *Eleutherodactylus cerasinus* (Cope, 1875)] and *Eleutherodactylus marshae* [= *Eleutherodactylus dubitus* Taylor, 1952 = *Eleutherodactylus cruentus* (Peters, 1873)]. Nevertheless, *E. moro* is so strikingly different from any other known member of the genus in morphology and coloration that description seems justified. Repeated attempts to collect other examples at the type locality proved fruitless.

The new species is named for my colleague and fellow Costa Rican enthusiast, Dr. John Luther Mohr, who has specialized in studies of the opalinid ciliate protozoa of anuran digestive tracts.

This paper is the first in a series aimed at a revision of the systematics of the Middle American frogs of the genus *Eleutherodactylus*.

#### LITERATURE CITED

COPE, EDWARD D.

1875. On the Batrachia and Reptilia of Costa Rica. *J. Acad. Nat. Sci. Philadelphia* (letterpress), ser. 2, (8):93-157.

LYNCH, JOHN D.

1964. A small collection of anuran amphibians from Panama, with the description of two new species of *Eleutherodactylus* (Leptodactylidae). *J. Ohio Herp. Soc.*, 4(3):65-68.

PETERS, WILHELM

1873. Über eine neue Schildkrotenart, *Cinosternon effeldtii* und einige andere neue oder weniger bekannte Amphibien. *Monatsberichte Koniglich Preussischen Akademie Wissenschaften*, Berlin, 1873:604-618, pl. 5.

TAYLOR, EDWARD H.

1952. The frogs and toads of Costa Rica. *Univ. Kansas Sci. Bull.*, 35, pt. 1 (5):577-942.

1955. Additions to the known herpetological fauna of Costa Rica with comments on other species. No. II. *Univ. Kansas Sci. Bull.*, 37, pt. 1 (13):499-575.